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10/649,123	08/27/2003	Anne T. Katz	IDT-1742.DIV	4756

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EXAMINER

SMOOT, STEPHEN W

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 03/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/649,123

Applicant(s)

KATZ, ANNE T.

Examiner

Stephen W. Smoot

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2003 and 14 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 21-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 21-27 and 29-32 is/are rejected.
- 7) ☒ Claim(s) 28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

This Office action is in response to application papers filed on 27 August 2003 and applicant's preliminary amendment received on 14 October 2003. It is noted that the papers filed on 27 August 2003 included instructions to amend the claims by canceling the originally filed claims 9-20, while the preliminary amendment received on 14 October 2003 includes newly added claims 9-20. Per 37 CFR 1.126, which states that added claims "must be numbered by the applicant consecutively beginning with the number next following the highest numbered claim previously presented," the newly added claims have been renumbered as claims 21-32.

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "19" has been used to designate both bonding pads in Fig. 3 (see page 10, line 8) and the bottom surface of the package substrate in Fig. 4 (see page 10, line 22). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The disclosure is objected to because of the following informality:

Update the first sentence of the specification to indicate that US Patent Application serial No. 10/231,636 is now US Patent No. 6,686,221.

Appropriate correction is required.

### ***Claim Objections***

3. Claims 1-8, 21-32 are objected to because of the following informalities:

In claim 1, line 4, insert --to-- after the first appearance of "coupled" to correct grammar;

Claims 2-8 are objected to because they depend on claim 1;

In claim 21, line 4, insert --to-- after the first appearance of "coupled" to correct grammar;

Claims 22-28 are objected to because they depend on claim 21;

In claim 29, line 4, insert --to-- after the first appearance of "coupled" to correct grammar; and

Claims 30-32 are objected to because they depend on claim 29.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "said adhesive" in line 1. There is insufficient antecedent basis for this limitation in the claim. It is noted that claim 8 would have proper antecedence if it depended from claim 2 instead of claim 1.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-7, 21-27, 29-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al.

Referring to Fig. 1 and column 4, line 52 to column 6, line 39, Lee et al. disclose a multi-chip module utilizing a ball grid array substrate (also see column 3, lines 61-67) that has the following structural features:

- A substrate (20) with solder balls (27) attached to the back surface (201);
- An adhesive layer (28) is used to join a first semiconductor chip (21) to the front surface (200) of the substrate (20);
- A first set of gold wires (22) electrically connects the first semiconductor chip (21) to the substrate (20);
- An adhesive layer (23) is used to join an overlying second semiconductor chip (24) to the first semiconductor chip (21);
- The adhesive layer (23) also functions as an encapsulating layer since it entirely wraps the portions of the first set of gold wires (22) that are positioned directly above the first semiconductor chip (21) (see column 5, lines 25-32);
- A second set of gold wires (25) electrically connects the second semiconductor chip (24) to the substrate (20); and
- An encapsulation body (26) encapsulates the second set of gold wires (25) and the second semiconductor chip (24).

These are all of the limitations set forth in claims 1-7, 21-27, 29-32 of the applicant's invention.

8. Claims 1-5, 21-24, 26-27, 29-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Ano.

Referring to Fig. 3 and paragraphs [0015] to [0023], Ano discloses a multi-chip module that has the following structural features:

- A lower IC chip (10) connected to a substrate (40);
- Bond wires (not numbered) electrically connect the lower IC chip (10) to the substrate (40) (also see paragraph [0005]);
- A die attach material (220) is used to encapsulate the portions of the bond wires positioned above the lower IC chip (10) (also see paragraph [0019]);
- A layer of insulating material (230), that can be epoxy, joins an upper IC chip (30), that overlies the lower IC chip, to the die attach material (220);
- Bond wires (not numbered) electrically connect the upper IC chip (30) to the substrate (40) (also see paragraph [0005]); and
- Additional chips can be stacked above the two chips, implying that the portions of the bond wires positioned above the upper IC chip (30) would be encapsulated in the same manner as those corresponding to the lower IC chip (see paragraph [0017], last sentence).

These are all of the limitations set forth in claims 1-5, 21-24, 26-27, 29-32 of the applicant's invention.

***Allowable Subject Matter***

9. Claims 8, 28 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, second paragraph, and/or the objections set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not teach or suggest, in combination with the other claim limitations, a packaged semiconductor device with two stacked semiconductor dice, wherein bond wires on the lower die are encapsulated with encapsulant and wherein a silver-filled epoxy adhesive is used to join the encapsulant to the upper die.

***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Heo and Tsai et al. teach semiconductor packages that feature stacked chips that are wire bonded to a ball grid array substrate.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen W. Smoot whose telephone number is 571-272-1698. The examiner can normally be reached on M-F (8:00am to 4:30pm).



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SWS

*Stephen W. Smoot*  
Patent Examiner  
Art Unit 2813